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Attitudes towards mandatory vaccination and sanctions for vaccination refusal



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ABSTRACT

Aims: Investigating attitudes towards mandatory vaccination and sanctions for vaccination refusal in an area with insufficient vaccination coverage may help health authorities to assess which strategies for increasing vaccination coverage are appropriate. This study examines attitudes to vaccine mandates and asks questions regarding what kinds of sanctions could legitimately result from vaccination refusal. It seeks to find out if people's attitudes towards mandates and towards sanctions for vaccination refusal are related to their attitudes to vaccines and the degree of trust they feel towards health care professionals and health care authorities. The study also discusses how the observed attitudes towards mandates may be related to perceptions of autonomy, responsibility, and equitability.

Methods: Data collection was carried out in Finland through an online survey in a region with suboptimal vaccine uptake. Statistical analysis was conducted on a sample of 1101 respondents, using confirmatory factor analysis and structural regression analysis.

Results: Persons hold different views on mandates and sanctions. Importantly, the persons who support vaccination mandates and sanctions for vaccination refusal are to a great degree the same people who have positive attitudes to vaccines and high trust in health care professionals and health authorities.

Conclusion: Trust is a key factor which has a bearing on people's attitudes towards mandates and sanctions for noncompliance. A focus on the reasons for lack of trust, and on how to enhance trust, is a more feasible long-term way (than mandates) to promote large-scale compliance with childhood vaccine programmes in the studied country context.

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1. Background of the study

Large scale immunisation is considered one of the foremost ways to prevent infectious and potentially deadly diseases and improve general population health. Examples of historical and contemporary successes to this effect abound. At the same time, the World Health Organisation has recently called out vaccine hesitancy as a serious threat to global health [1]. In response to problems resulting from insufficient vaccination coverage, governments have utilized different types of interventions. One such intervention adopted by several countries is legislation that mandates vaccines.

Mandatory vaccination is a heterogeneous concept when, for example, it comes to the specific vaccines, target populations, exemptions, and sanctions for noncompliance [2,3,4]. Even though several countries have adopted vaccine mandates, few countries have settled on large scale mandatory vaccination. In general, the legislative approaches to immunization differ [5].

Mandatory vaccination typically means that only medical exemptions from vaccination are accepted. That is, exemptions from mandatory vaccination on religious or philosophical grounds, or because of more general personal reasons, are disallowed [6,7,8]. Researchers have maintained that allowing so-called non-medical exemptions result in higher overall exemption rates, and thus in consequence also in higher levels of illness [7,9,10,11]. The question of how narrowly or widely to define the scope of an exemption therefore becomes central. Sometimes problematic distinctions are made between familiar and more unfamiliar so-called convictions, to the detriment of the latter, and, for example, to dis-

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tinguishing within the category of religion in an unjustified manner [7,9].

Research on the effect of mandatory vaccination on vaccine uptake has often been discussed in more detail for rather standard selection of countries—for example, the USA, Australia, France, and Italy—and forms of intervention [2,12]. This research has shown that vaccination mandates accompanied by, to some extent, different kinds of (legal) medical and nonmedical exemptions have not greatly affected vaccine coverage. In fact, a recent study investigating the effects of mandates on vaccine uptake in 29 European countries [13], indicated that the incidence of measles was lower only when there was no possibility of non-medical exemptions from mandatory vaccinations. Put another way, thus far the results are not unequivocal as to whether mandates are an effective method for improving vaccine/immunisation coverage or not [5,6,9,14].

Vaccination mandates is a disputed topic and opposition exists both in the general public and among health care professionals [15]. The main concerns are that mandates may weaken public trust and result in more negative attitudes to vaccines [16]. A recent longitudinal study conducted in Germany during the COVID-19 pandemic, in fact, indicates that people's willingness to get vaccinated would likely decrease if mandatory vaccinations were implemented [17]. Furthermore, the results from an experimental study shows that mandates can result in reactance and an unwillingness to accept other, non-mandatory vaccines in participants who have negative or neutral attitudes to vaccines [18]. Reactance is characterized by negative emotions such as anger that may arise when people feel that their freedom of choice has been threatened or taken away [19].

The results from a recent systematic review of studies investigating parental attitudes towards mandatory vaccination for childhood vaccines show relatively high support for mandatory vaccination. The results, however, also show that some parents consider mandatory vaccination to be an infringement of their rights [4].

The issues of public trust and exemptions testify to how vaccine-related issues touch upon ethical questions. Different forms of interventions, depending on how they are designed, may de facto come with side effects that give rise to ethical questions. Vaccine mandate policies result in limits to, for example, parental liberty and personal autonomy [20] and thus raises questions about how to balance the right to autonomy or self-determination, including parental rights, against the perspectives “the best interest of the child” and/or “public health” [18].

Legislating vaccination mandates means imposing some kind of sanctions for vaccine refusal. The topic of sanctions is another ethical perspective which, in this context, is addressed in the literature. It relates to the question of what is ‘just’ in different ways of handling/penalising those who oppose mandatory vaccination. Different kinds of so-called incentives like targeted schemes with financial incentives to ultimately promote vaccine uptake are also discussed, sometimes under the heading of ‘sanctions’ [3]. (In this article, we use the term ‘sanctions’ as a general term for different kinds of consequences for non-compliance with mandates). What might freedom ‘cost’, so to speak? What is acceptable and proportionate in terms of sanctions for non-compliance with mandates, for example, regarding fines or other economic disadvantages, discontinuation of (public) day-care and preschool opportunities, being made to cover all potential health care costs in case of falling ill, and so forth. Moreover, persons may end up without vaccine not because they resist vaccines or hesitate about them, but because of limited access, because, for example, they live remotely or belong to vulnerable and marginalised groups [3,10,14,16].

Hence, issues of access to mandatory vaccines (e.g., availability, costs) in such situations, as well as sanctions for non-compliance

may affect different groups differently; for example, by disproportionately affecting economically and socially disadvantaged groups [2,3,14,20,21]. With regard to any policy, it is important to consider if interventions impact differently depending on class, ethnicity, marginalisation and minority position, and so forth. It is also important to reflect on what measures can benefit exactly those groups of people whose vaccine conduct results from grounds unrelated to vaccine hesitancy or outright vaccine opposition.

All in all, researchers disagree at least partly about whether such outcomes, and if so, then more specifically which outcomes, are ethically defensible [22,23,24]. It is not self-evident that mandatory vaccination is the way forward from an ethical perspective, even if one recognises that, in general, the aim is to protect a social good like public health and the individual right to health, and that states have certain responsibilities in this respect [11,25,26]. Policy makers make the final decisions on vaccine mandates. Attwell and Navin (2019) point out that different types of vaccine mandate policies need to be assessed as to their specific components or “legally and morally significant features”, including the scope of vaccines covered, sanctions for non-compliance and their severity, as well as selectivity (in the sense of “management of enforcement and exemptions”) [3].

Indeed, it is important to study attitudes and policies related to vaccines in context. As Adel Ali and Pastore Celentano (2017) point out: “the underlying determinants of hesitancy can be numerous and need to be studied in the specific setting where hesitancy is observed.” [27] Hereby, they view the question of trust as a foundational factor. In a similar manner, Attwell et al. (2018) underscore that decision makers—presumably also when contemplating mandate schemes—must consider the political-cultural context and its vaccine policy history [2,5]. Attwell et al. (2018) maintain that it is important whether or not individuals trust public authorities when these authorities limit individual freedom for purposes of promoting public/general health [2]. What is also of significance, for example, is whether citizens have previous experience with vaccine mandates. Likewise, a recent systematic review of qualitative and quantitative studies into parental attitudes towards mandatory vaccination points out that “[t]o optimise engagement with existing child mandatory vaccination legislation, schemes should be designed with parental beliefs in mind.” [4]

This underscores the importance of conducting contextual studies like the present one for the purpose of deepening the understanding of attitudes towards vaccines and vaccine policies like vaccine mandates, including for purposes of devising meaningful/efficient vaccine policies.

2. Context of the study

The overall focus of the present study is attitudes towards vaccine mandates for childhood vaccines among the general public in Finland. Finland is a country whose inhabitants, according to a recent report on European vaccine attitudes [28], count among those who have most trust in/are most positive towards vaccines/vaccinations. Only approximately one percent of Finnish children below the age of four have received no childhood vaccines [29]. However, studies conducted in Finland [30,31,32] suggest that a notable share of respondents hesitate in the decision to get vaccinated, even if most choose to receive the vaccines in the end. In these studies, the likelihood of getting vaccinated is higher in people who perceive the vaccine as safe [30,32] and who have high trust in health professionals and health/political authorities [31,33].

Finland has a national vaccination program that is publicly funded and with municipalities in charge of its implementation.

The Finnish Institute for Health and Welfare (THL) monitors both regional and national vaccination coverage in Finland and is responsible for a national vaccination register [34].

In Finland, childhood vaccinations are administered free of charge at child health clinics in accordance with the national vaccination program. Influenza vaccines are included in the national vaccination program free of charge for all risk groups, including children under the age of seven. The childhood and influenza vaccines are recommended, but not mandatory. However, since March 2017 the new Communicable Diseases Act 48§5 requires health care professionals who work with at-risk populations to be immunized against measles, chickenpox, and influenza. Health care professionals who are not vaccinated against influenza, may be assigned to other tasks [35,36].

The Communicable Diseases Act (1227/2016; Section 47.1, see also Section 54) recognises compulsory vaccination as a possibility in only a few clearly delineated cases of public emergency: “Provisions on organising compulsory vaccination can be issued by Government decree, if comprehensive vaccination is necessary to prevent the spread of a generally hazardous communicable disease capable of causing substantial harm to the life and health of the population or a part thereof. A compulsory vaccination may also be limited to a certain part of the population, a group or age class.” [35] Thus far, this section of the law has never been applied.

Additionally, and as noted above, certain vaccinations (or immunity in relation to those diseases) are mandatory for health personnel working directly with high-risk groups (Section 48:1–3): “For work in the client and patient facilities of social welfare and health care units, which are used for treating clients or patients who, based on medical assessment, are susceptible to severe consequences from communicable diseases, a person with inadequate protection from vaccination may only be used in exceptional circumstances. Employees and students in practical training must be protected against measles and varicella, either through vaccination or by having had the disease. In addition, vaccination against influenza is required, as is vaccination against whooping cough for persons treating infants. Student health care services must ensure that students participating in practical training have the protection from vaccination referred to in sub-section 2.” [35] Still, by and large, vaccination is voluntary, and non-compliance carries with it no sanctions.

However, the issue of mandates and related legal and ethical questions has also been a topical issue in Finland. A recent report of a working group tasked by the Ministry of Social Affairs and Health in Finland with examining how vaccination activities and vaccine coverage could be improved, addressed the questions of mandates and sanctions. The report did so from a fundamental rights perspective, yet also underscoring that such a legal perspective is connected to what the working group terms “moral-ethical reasoning” [26]. As “ethical questions” related to vaccines, the report identifies “what distrust in vaccines is due to, how one can affect distrust of vaccines, and if distrust is morally acceptable” (*authors’ translation*) [26]. Moreover, the report identifies as one of the most difficult ethical questions that of the value basis for interventions that promote population health and well-being, and the so-called moral justifications for such interventions [26].

In its report, the working group also discusses sanctions for non-compliance: loss of/reduced child allowance or, alternatively, a bonus when all vaccines that form part of the national vaccine program have been received; as well as divestment of the right to participate in early childhood education and schooling. The working group clearly ends up resisting these sanctions. It bases its position on the fundamental rights and human rights of children, including the fact that sanctions of an economic kind could deepen economic inequality among children.

3. Research questions

Continuing this ongoing international and Finnish conversation, in this article we discuss vaccination mandates from an ethical perspective. For the purposes of this discussion, we collected data with the aim of studying public attitudes towards mandating vaccination. Our population of interest is people living in the Pietarsaari region, which is an area with suboptimal uptake of several vaccines included in the national vaccination program in Finland [37]. For example, among children born in 2018 in the region, only 74% have received the first dose of the rotavirus vaccine and 80% the first dose of the pneumococcal vaccine [37]. On a national level, the uptake of these vaccines are 93% and 97%, respectively [37]. The Pietarsaari region is among the Finnish regions with the highest percentage of children who are completely unvaccinated by the age of 3 [29]. Investigating attitudes towards mandatory vaccination and sanctions for vaccination refusal in an area with insufficient vaccination coverage may help health authorities to assess which strategies for increasing vaccination coverage are appropriate.

In addition to examining attitudes to vaccine mandates, we ask questions probing opinions regarding what kinds of sanctions could justifiably result from vaccination refusal. We are also interested in finding out if people’s attitudes towards mandates and towards sanctions for vaccination refusal are related to their attitudes to vaccines and the degree of trust they feel towards health care professionals and health care authorities. It is important in this context also to consider the role of public trust and vaccine attitudes in people’s attitudes to mandatory vaccinations, as there is a worry that vaccine mandates may decrease public trust and increase vaccine hesitancy. In fact, in the study by Betsch and Böhm (2016), compulsory vaccinations decreased the willingness to take vaccines only among those individuals who had negative attitudes to vaccinations to begin with [18]. There is also previous support for an association between opposition to mandates and lower trust in health care professionals [38] and public institutions [17].

Finally, our results lead us to explore a number of ethical perspectives on the discussion, and how the observed attitudes towards mandates may be related to perceptions of autonomy, responsibility, and equity/justice.

4. Methods

4.1. Respondents and procedure

In April 2019, 5000 18–65-year-old individuals living in the Pietarsaari region in Finland were invited by mail to participate in an online survey on vaccine attitudes. The individuals were drawn from the Finnish Population Information System [39] which is a national register maintained by the Digital and Population Data Services Agency and it includes all individuals residing in Finland. The invited individuals were selected through stratified sampling based on the distribution of gender and language (Finnish; Swedish) within the region. The invitation letter contained a description of the study and a web address to the survey. One reminder letter was sent out. The individuals were not offered any incentives. A total of 1139 (22.8%) invitees responded to the survey. Of these, 38 did not answer any of the questions relevant for the present study and were excluded from the sample. The final sample size was thus 1101 (22.0%). Descriptive information about the sample is presented in Table 1.

Ethical approval was received from the Board for Research Ethics at Åbo Akademi University. Before filling out the questionnaire, the respondents were informed that participation in the

Table 1
Descriptive Information About the Respondents (N = 1101).

Variable	n	%
Gender		
Female	722	65.58
Male	373	33.88
Age		
18–29	255	23.16
30–39	290	26.34
40–49	212	19.26
50–59	201	18.26
60–	142	12.90
Language		
Finnish	168	15.26
Swedish	933	84.74
Have children		
Yes	797	72.39
No	304	27.61

Note. Six (0.54%) respondents did not report their gender. One (0.09%) respondent did not report their age.

study was anonymous and voluntary, and that they could withdraw at any time. Informed consent to participate was given electronically.

4.2. Attitudes towards mandates

Opinions on the possibility of mandatory vaccinations were measured with four statements (e.g., “Childhood vaccines should be mandatory”; Table 2). The answers were given on a scale from 1 (completely disagree) to 5 (completely agree).

Table 2
Distribution of Responses to the Questions on Mandates and Sanctions on the Scale 1 (Completely Disagree) to 5 (Completely Agree).

Construct	Question	Response alternative	n	%
Mandates	Childhood vaccines should be mandatory.	1	45	4.09
		2	40	3.64
		3	36	3.28
		4	288	26.21
		5	690	62.78
	The law should guarantee individual freedom with regard to vaccination (freedom to not vaccinate oneself or one's children). (R)	1	58	5.28
		2	82	7.46
		3	115	10.46
		4	327	29.75
		5	517	47.04
	Under specific circumstances, public authorities should make vaccinations mandatory.	1	91	8.27
		2	91	8.27
		3	116	10.55
		4	348	31.64
		5	454	41.27
The state should not interfere with people's vaccination behavior. (R)	1	45	4.09	
	2	88	8.01	
	3	104	9.46	
	4	366	33.30	
	5	496	45.13	
Sanctions	Unvaccinated children should not be allowed to attend public kindergartens, preschools or schools.	1	154	14.01
		2	172	15.65
		3	194	17.65
		4	318	28.94
		5	261	23.75
	Parents who choose not to have their children vaccinated should lose the right to or receive reduced child benefit.	1	260	23.66
		2	142	12.92
		3	219	19.93
		4	241	21.93
		5	237	21.57
	The freedom of movement of unvaccinated individuals should be restricted.	1	220	20.04
		2	170	15.48
		3	264	24.04
		4	276	25.14
		5	168	15.30

Note. (R) = Reverse-scored item.

4.3. Attitudes towards possible sanctions for vaccination refusal

Three statements measured people's opinions on possible sanctions for vaccination refusal, two of which connect to the sanctions explored by the working group of the Ministry of Social Affairs and Health: (“Unvaccinated children should not be allowed to attend public kindergartens, preschools or schools”, “Parents who choose not to have their children vaccinated should lose the right to or receive reduced child benefit”, “The freedom of movement of unvaccinated individuals should be restricted”; Table 2). In Finland, most children attend public—meaning state—schools and the attendance in public preschools is also high. All children who live in Finland and are covered by the Finnish social security are entitled to child benefit until the age of 17. The answers were given on a scale from 1 (completely disagree) to 5 (completely agree).

4.4. Vaccine attitudes

Nine statements measured respondents' attitudes to childhood vaccines (e.g., “Childhood vaccines are effective in protecting against disease”; Table 3). Response alternatives ranged from 1 (completely disagree) to 6 (completely agree).

4.5. Trust

Five statements were created to measure trust in health care professionals and health authorities in the vaccination context (e.g., “I trust the information I receive from doctors about vaccines” and “I trust the vaccine recommendations given by health author-

Table 3
Distribution of Responses to the Questions on Vaccine Attitudes and Trust on the Scale 1 (Completely Disagree) to 6 (Completely Agree).

Construct	Question	Response alternative	n	%
Vaccine attitudes	Vaccinating children protects others by stopping the spread of diseases.	1	14	1.30
		2	5	0.46
		3	31	2.88
		4	36	3.34
		5	128	11.88
		6	863	80.13
	Childhood vaccines are effective in protecting against disease.	1	15	1.40
		2	7	0.65
		3	20	1.86
		4	49	4.56
		5	196	18.23
		6	788	73.30
	Childhood vaccines are unnecessary as good hygiene makes the diseases disappear from society. (R)	1	840	78.14
		2	157	14.60
		3	26	2.42
		4	22	2.05
		5	13	1.21
		6	17	1.58
	Children need to be vaccinated against measles even though the disease is not common in Finland anymore.	1	33	3.07
		2	14	1.30
		3	27	2.51
		4	41	3.82
		5	115	10.71
		6	844	78.58
It is better to get immunity from the diseases that the childhood vaccines prevent against than from the vaccines. (R)	1	651	60.96	
	2	191	17.88	
	3	103	9.64	
	4	55	5.15	
	5	33	3.09	
	6	35	3.28	
Childhood vaccines cannot cause autism.	1	61	5.77	
	2	63	5.95	
	3	253	23.91	
	4	130	12.29	
	5	171	16.16	
	6	380	35.92	
Childhood vaccines do not contain dangerous quantities of mercury.	1	44	4.18	
	2	44	4.18	
	3	232	22.03	
	4	151	14.34	
	5	193	18.33	
	6	389	36.94	
Childhood vaccines are safe.	1	19	1.77	
	2	31	2.89	
	3	74	6.90	
	4	106	9.89	
	5	336	31.34	
	6	506	47.20	
The benefits of the childhood vaccines outweigh the risk of side-effects.	1	18	1.68	
	2	19	1.78	
	3	52	4.86	
	4	71	6.64	
	5	211	19.74	
	6	698	65.29	
Trust	I trust the information I receive from nurses/public health nurses about vaccines.	1	31	2.90
		2	48	4.49
		3	86	8.04
		4	116	10.84
		5	302	28.22
		6	487	45.51
	I trust the information I receive from doctors about vaccines.	1	28	2.60
		2	42	3.91
		3	71	6.60
		4	112	10.42
		5	302	28.09
		6	520	48.37
	Healthcare professionals would not recommend vaccines that are unsafe.	1	27	2.52
		2	53	4.94
		3	99	9.24
		4	128	11.94
		5	297	27.71
		6	468	43.66

Table 3 (continued)

Construct	Question	Response alternative	n	%
	Healthcare professionals take my questions about vaccines seriously.	1	18	1.96
		2	30	2.81
		3	113	10.60
		4	127	11.91
		5	279	26.17
		6	499	46.81
	I trust the vaccine recommendations given by health authorities.	1	29	2.70
		2	36	5.59
		3	60	11.00
		4	118	27.68
		5	297	27.68
		6	533	49.67

Note. (R) = Reverse-scored item.

ities”; Table 3). The responses were given on a scale from 1 (completely disagree) to 6 (completely agree).

4.6. Statistical analyses

In our analysis of the data, we used confirmatory factor analysis (CFA) to create latent factors of our four constructs: attitudes towards vaccination mandates (Mandates), attitudes towards sanctions for vaccination refusal (Sanctions), attitudes towards childhood vaccines (Vaccine attitudes), and trust in health care professionals and health authorities (Trust). In CFA, the variables within each construct are pooled by estimating the correlations between the variables, thus creating one single latent factor for each construct [40]. After creating the four factors, we analysed the correlations between them. In addition, we used structural regression analysis to investigate whether individuals’ attitudes to mandates and attitudes to sanctions for vaccination refusal differed depending on their gender, age, and on whether they had children or not. Concerning age, respondents were asked in the questionnaire to indicate which age span they belonged to (18–29, 30–39, 40–49, or 50–59 years old, or 60 + years old). Each age span was compared to the preceding age span in the analyses. We conducted the analyses using the *lavaan* package in R, version 3.5.1 [41,42]. WLSMV estimation and pair-wise deletion were conducted.

5. Data (results)

The results showed that most respondents support the option of vaccination mandates for childhood vaccines and for vaccines in general (Fig. 1; Table 2). There is great variation between how people feel about sanctions for non-vaccination, with approximately the same number of people supporting sanctions as being against them. A clear majority of the respondents have positive attitudes towards childhood vaccines and show high trust in the information about vaccines they receive from health care professionals and health authorities (Table 3).

The four latent factors fitted the data well (see, Table S1 and S2). The correlation between Mandates and Sanctions ($r = 0.81, p < .001$) was very strong, indicating that individuals with more positive attitudes to mandates were more likely to endorse the implementation of sanctions for vaccine refusal. There was also a strong association between Trust and Mandates ($r = 0.72, p < .001$). This association indicated that individuals who have greater trust in health care professionals and health authorities

have more positive attitudes to mandatory vaccination. There was a positive and moderate correlation between Trust and Sanctions ($r = 0.43, p < .001$), suggesting that those with greater trust also have more positive attitudes to the implementation of sanctions for vaccine refusal. Lastly, Vaccine attitudes were strongly related to Mandates ($r = 0.79, p < .001$), Sanctions ($r = 0.55, p < .001$), and Trust ($r = 0.87, p < .001$), indicating that individuals with more positive attitudes to vaccines are more likely to support mandates, support sanctions for vaccine refusal, and trust health care professionals and health authorities. Even though the results show that almost all of the people who support sanctions are positive toward mandates for vaccine refusal and have positive vaccine attitudes, Fig. 2 shows that some of the people who are in favour of mandatory vaccinations and have positive vaccine attitudes do not support the presented sanctions.

Respondent gender was unrelated to attitudes to mandates, but women were slightly more likely than men to have negative attitudes towards the sanctions for non-vaccination (Table 4).

There was a weak relationship between age group and attitudes to mandates: thus 30–39-year-olds had slightly more negative attitudes towards mandates than 40–49-year-olds. Age was not associated with attitudes toward possible sanctions imposed due to vaccine refusal. There was also no association between whether the respondents had children or not and to what degree they supported mandates and possible sanctions.

6. Discussion

The present study investigated attitudes toward mandatory childhood vaccinations and sanctions for vaccination refusal in an area of Finland with suboptimal vaccination coverage for several vaccines. The results show that three-fourths of those individuals were in favour of mandates. Individuals who were against mandates for childhood vaccines also did not support the idea of sanctions for vaccine refusal and had more negative attitudes to vaccines and a lower trust in health care professionals and health authorities.

6.1. Responsibility

The fact that most respondents supported vaccination mandates for childhood vaccines and sanctions for vaccination refusal is in line with previous studies [4]. Interpreting these findings from the perspective of responsibility, it seems that, in the case of vaccines, people are considered to have responsibility not only for

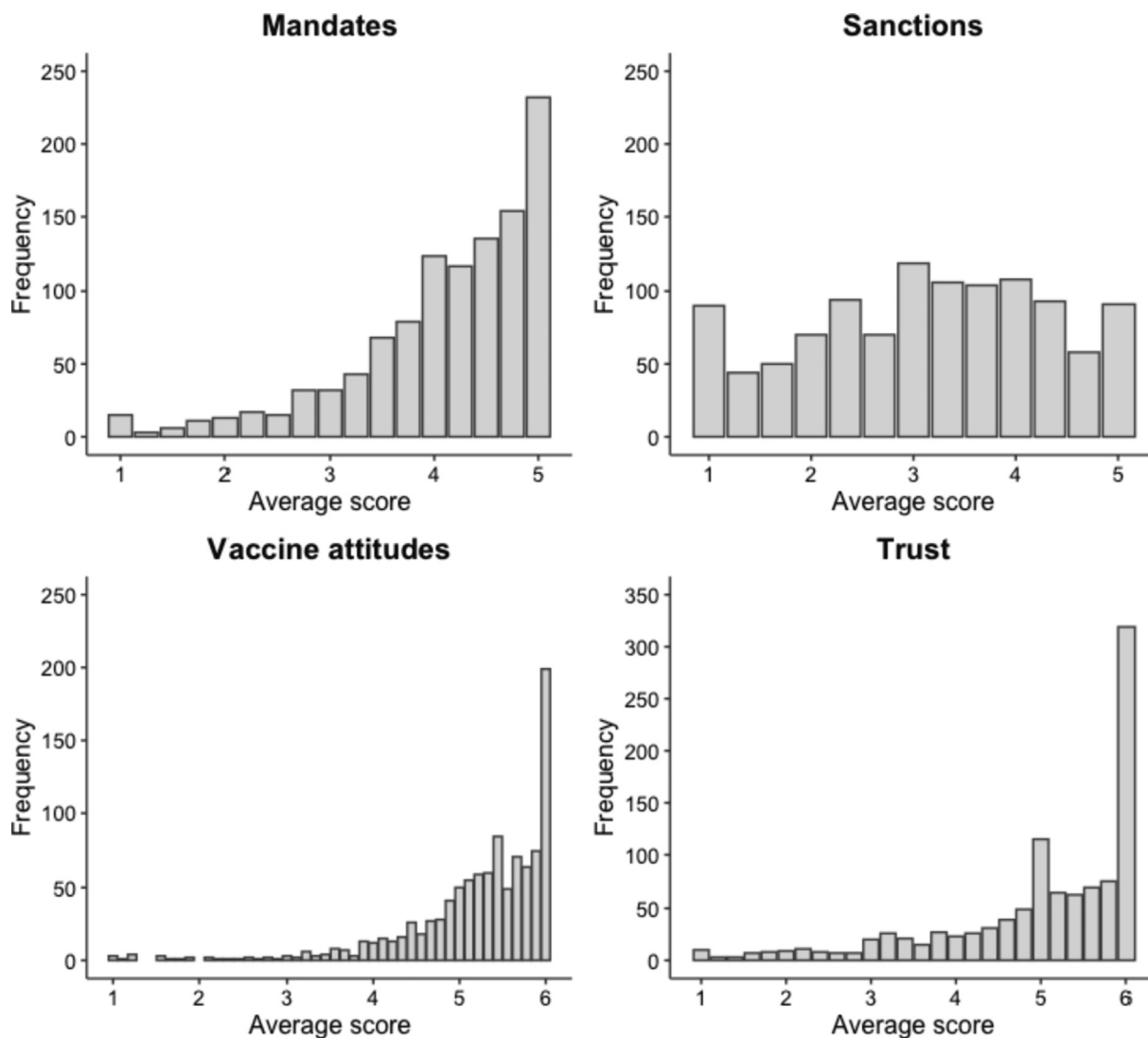


Fig. 1. Distribution of the respondents' average responses to the questions about mandates, sanctions, vaccine attitudes, and trust. Higher scores mean more positive attitudes to mandates, sanctions, and vaccines, as well as higher degree of trust.

themselves and their children, but also for society at large. We can talk here of collective responsibility. Respondents find that individuals must take responsibility themselves, but also that public authorities/the state should take responsibility. Public authorities may have the right to limit individuals' freedom for purposes of protecting others and their health. The findings from a recent study by Korn et al. (2020), based on a set of experiments, show that vaccinated individuals were less generous towards unvaccinated individuals than unvaccinated people were. The results also showed that unvaccinated individuals showed lower levels of generosity towards unvaccinated people than towards vaccinated individuals [43]. These findings lend support to the idea that vaccination can be considered a social contract, in which taking a vaccine is considered the morally right thing to do.

In another Nordic context, Gamlund et al. (2020) [24] point to a recent Norwegian survey experiment by Arnesen et al. (2018) [44] on positions on herd immunity, the results of which “suggested that a concern for others highly influences people’s decision to vaccinate or not to vaccinate” [24], even somewhat more so than potential individual benefits of vaccination [44]. (We can also talk here of “the self- and other-directed effects of vaccination” [45]). According to Arnesen et al. (2018), their study aligns with other

studies that highlight “altruistic concerns” as a key factor in people’s vaccine decisions [44,46,47].

6.2. Autonomy

Conversely, based on the results of the present study, issues of *autonomy/freedom* seem to play a lesser role for our informants. Recognising individual freedom and identifying the limits to this freedom is generally considered as an important part of thinking through the issue of mandatory vaccinations. Such individual freedom needs to be balanced with the rights of others and community welfare, including the prevention of serious harm [7]. There are limits to parental autonomy when it comes to making decisions about their children [24].

Relating to this issue, the recent review study of parental views of childhood vaccine mandates by Smith et al. (2021) finds that all but one of the five qualitative studies that they reviewed showed that some parents considered such mandate schemes as “an infringement of their right to choose whether to vaccinate their child.” [4]

By comparison, our data seem to indicate that to a high degree respondents find that individual autonomy can be circumscribed.

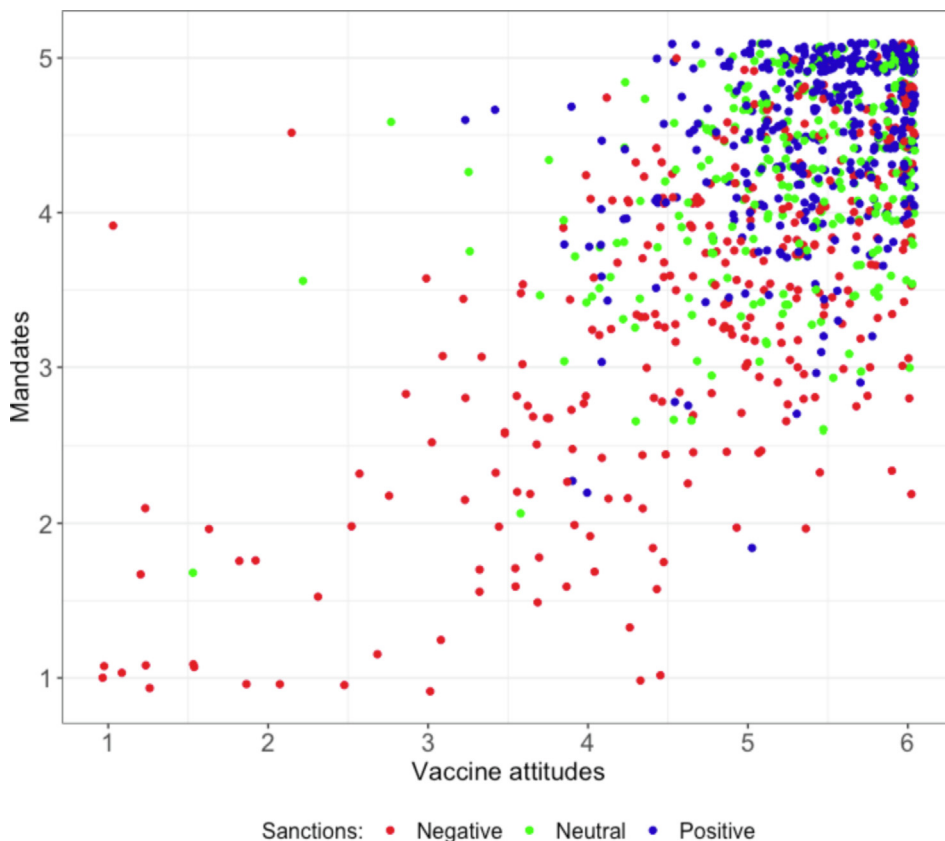


Fig. 2. The relationship between attitudes to mandates (y-axis) and attitudes to vaccines (x-axis). A dot represents a respondent's average response to the questions of each construct. Respondents' attitudes to sanctions are represented by red (response alternative 1 or 2 on the scale ranging from 1[completely disagree] to 5 [completely agree]), green (response alternative 3), and blue (response alternative 4 or 5) dots. The dots have been jittered for better visibility.

Table 4
Regression Results.

Variable	Standardized estimates			
	β	95% CI	z	p
Mandates				
Children: No	0.01	[-0.08, 0.09]	0.14	0.890
Gender: Female	-0.06	[-0.13, -0.01]	1.69	0.091
Age: 30–39 vs. 18–29	-0.08	[-0.17, -0.01]	1.70	0.089
Age: 40–49 vs. 30–39	0.12	[0.02, 0.22]	2.27	0.023
Age: 50–59 vs. 40–49	0.01	[-0.09, 0.11]	0.23	0.822
Age: 60 + vs. 50–59	0.03	[-0.05, 0.11]	0.75	0.453
Sanctions				
Children: No	0.04	[-0.04, 0.12]	0.90	0.371
Gender: Female	-0.10	[-0.17, -0.04]	3.00	0.003
Age: 30–39 vs. 18–29	-0.07	[-0.16, 0.02]	1.51	0.131
Age: 40–49 vs. 30–39	0.02	[-0.08, 0.12]	0.43	0.665
Age: 50–59 vs. 40–49	0.05	[-0.05, 0.15]	1.01	0.310
Age: 60 + vs. 50–59	0.02	[-0.06, 0.11]	0.55	0.580

Note. Model fit: $\chi^2(43) = 92.95$, CFI = 0.985, TLI = 0.993, RMSEA = 0.033; 90% CI[0.023, 0.042], SRMR = 0.035.

On the other hand, in situations where individual autonomy takes precedence, for example, in the sense that parents may refuse vaccines on behalf of their children, then it becomes paramount to consider the significance of such choices for those who are affected by them.

6.3. Justice/equitability

Here, *justice* seems to play a role in how one views possible sanctions, including so-called “public solidarity sanctions” that

encompass exclusion from different public spaces [3] due to vaccine refusal/non-compliance. In our survey, we asked what could be justified sanctions: reduced child allowance, limited access to day care and school—a growing trend internationally [23]—or limiting the freedom of movement of persons. The data shows distributions in the responses.

Hence, while there is overall high support for mandatory childhood vaccines, the data shows that opinions split over possible sanctions. This result may indicate that the issue at stake is perceived by many as very complex, including in an ethical sense.

This also resonates with literature on the topic. For example, in their discussion about sanctions following upon vaccine refusal, Gamlund et al. (2020) underline the importance of distinguishing between sanctions against parents and sanctions against children. Refusing unvaccinated children the chance to attend day care or school means in effect making them “suffer doubly” [24]. It is a problematic sanction that should be avoided. (This can be compared to Diekema (2014) who finds mandatory vaccination as a requirement for school attendance as “less intrusive on individual liberty than a broader requirement for immunization of all children would be.” [7])

Attwell and Navin (2019) similarly underscore the importance of assessing consequences of vaccine mandate policies from an ethical perspective, including staying attentive to the social and political values (e.g., public trust, fairness, education) that are actualised, and the public goods that such policies seek to safeguard. To them, public health considerations could justifiably restrict access to particular public places (a kind of “solidarity sanction”) [3]. Scholars reach different conclusions as to what sanctions are ethically defensible [3,7,22,23,24].

6.4. Trust

Previous studies suggest that trust in health care professionals is among the most important predictors of willingness to be vaccinated [31,44,48]. Our results are in line with this, showing that a higher trust in the information given by health care professionals and authorities is associated with more positive attitudes towards vaccines. More importantly, our results further show that individuals who have higher trust also have less opposition towards vaccination-related mandates and sanctions, supporting the results from previous studies indicating a relationship between acceptance of mandates and trust in authorities [38] and public institutions [17].

Trust stands out as a key factor for recognising/endorsing the responsibility of public authorities for decision-making in vaccine-related matters. It must be remembered of course that the level of trust may differ depending on which public authority we are talking about. Trust in health/public authorities seems to include trusting that implementation of sanctions for vaccine refusal will be fair/equitable. Moreover, the positive and very strong correlation between attitudes to mandates and attitudes to sanctions could further be read as implying that individuals with more positive attitudes to mandates and who endorse the implementation of sanctions for vaccine refusal find that this accords with their sense of justice.

6.5. Mandate policies

In its report (2019) [26], the Finnish ministry working group tasked with pondering how to improve vaccination activities and coverage discussed, among other things, possible sanctions or, alternatively, financial incentives for neglected vaccination: loss or reduced child allowance (or alternatively a bonus when all vaccines included in the national vaccine program have been taken), as well as loss of the right to partake in early childhood education or schooling. That is, the working group discussed two of the three sanctions we included in our survey. In its report, the working group clearly distances itself from these sanctions and financial levers and incentives, based on its emphasis on children’s fundamental and human rights, including how the sanctions and levers explored by the working group could deepen economic inequality. The working group does emphasise what it calls an “ethics of obligation” where the focus is on collective responsibility and reciprocity. In general, parents hold the responsibility, and can thus be held to account. But with regard to the suggested sanctions, it would be

the children who would end up bearing the cost. Based on the results from our survey, it seems that at this point, the perspective of our respondents—which is not uniform—may largely coincide with the perspective the working group underlines by way of a vocabulary of rights (including the right of the child to a healthy life, in relation to which public authorities bear ultimate responsibility for determining what is best for the child).

On the other hand, given that to a large extent our respondents are positive toward mandates, it seems that to them, the perspective of fundamental and human rights in the sense of self-determination and autonomy may not be important in quite the same way as for the working group, for whom the resulting limits to fundamental and human rights come across as a crucial factor for discarding mandates and related sanctions or levers.

Pondering questions of the necessity, proportionality and desirability of mandates, the working group also notes that mandate schemes have had mixed results (e.g., reactance) and may not effectively target those groups whose vaccine behaviour it would be most crucial to influence. In conclusion, other ways of enhancing vaccine intake stand out as desirable, which is not to say that these other ways might not raise various ethical questions too.

Indeed, in its report the working group draws the conclusion that: “Earlier, the trust in healthcare actors was authority based. Nowadays the situation differs, and this has to be taken into account also in communication aimed at strengthening the trust in vaccinations.” (*authors’ translation*) [26] According to the working group, this situation demands that one “builds the trust on the basis of information, where the research activities, oversight and structures related to vaccination are transparent, open and up-to-date, a process where the population is encouraged to participate in an interactive and responsive way ... and accessible information, which means that people easily and via trustworthy sources find the information about vaccines that they are looking for.” (*authors’ translation*) [26]

Our earlier research [31,33] as well as the present data confirms this crucial link between trust in authorities and trust in vaccines, while the data of the present study also show that some kind of trust in authorities still remains high in the Finnish context.

7. Limitations

A limitation of the present study is that it is based on self-reported attitudes. This means that factors such as social desirability may have influenced the responses. Another possible limitation is that the questionnaire has not been validated in other samples. However, during the process of developing the questionnaire for the present study, the face validity of the questions was assessed by several researchers within the field (researchers within the present project as well as collaborators). Concerning limitations to generalizability, it is possible that individuals with certain characteristics, such as very negative or very positive attitudes to vaccines have been more interested in taking part in the study. This is because participation was based on self-selection. Relevant to note from a generalizability perspective is also that the present sample consisted of Finnish adults residing in a Finnish region with suboptimal vaccination coverage. The results, however, are in line with previous studies investigating the associations between trust and acceptance of mandates in other populations.

Furthermore, because of the cross-sectional design of the present study, all causal inferences are speculative. Finally, the data was collected before the COVID-19 pandemic, and the pandemic might have affected the public’s attitudes to mandates in general. It is also possible that attitudes toward mandates differ between different vaccines. In fact, the data collection reported above included a measure of the respondents’ attitudes to mandated

influenza vaccination. Even though most of the respondents supported mandates for childhood vaccines, most of them were against mandates for influenza vaccines (60.8% responded 1 or 2 on a scale ranging from 1 [completely disagree] to 5 [completely agree] to the statement “Influenza vaccines should be mandatory”).

8. Conclusions

Across the world, mandates are proposed as one way to enhance vaccine uptake. Mandate schemes can and do look different and they raise various legal and ethical issues, including how to correctly balance different values, rights, and societal goals and interests, and in doing so efficiently target the right population groups. Hence, the issue of mandates is a complex one, which our study also shows. Taken together, in our study the participants who support vaccination mandates and sanctions for vaccination refusal are to a great degree the same people who have positive attitudes to vaccines and high trust in health care professionals and health authorities. Or, put the other way around, people who have negative attitudes to vaccines are more likely to have low trust in health authorities and are against mandates and sanctions for vaccination refusal. Important to note is that also some of the people with positive attitudes to vaccines are against mandates.

Thus, trust in health authorities played an important role in people's attitudes towards vaccines, mandates and sanctions for noncompliance. The strong associations between these factors, and the potential negative consequences of mandatory vaccinations on vaccine acceptance (e.g., [16]), raise the question of whether focusing on the reasons for lack of trust, and on how to enhance trust, would be a more feasible long-term way than mandates to promote large-scale compliance with childhood vaccine programmes in Finland. This is also supported by the results of a recent longitudinal study indicating a causal relationship between increased trust in public institutions and increased willingness to accept mandatory vaccinations [17]. Whether interventions can be used to build public trust and through that increase vaccine acceptance, is a topic for future studies.

CRedit authorship contribution statement

Pamela Slotte: Conceptualization, Writing – review & editing. **Linda C. Karlsson:** Conceptualization, Methodology. **Anna Soveri:** Conceptualization, Methodology, Writing – review & editing, Project administration, Funding acquisition.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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All authors attest they meet the ICMJE criteria for authorship.

Appendix A. Supplementary material

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