



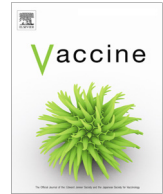
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Healthcare professional and professional stakeholders' perspectives on vaccine mandates in Switzerland: A mixed-methods study

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ABSTRACT

Background: There currently are no mandatory vaccines in Switzerland. However, Swiss federal legislation allows for vaccination mandates in settings where the risk of transmission to vulnerable groups is high, such as healthcare professionals (HCPs) working with vulnerable patients. Since HCPs are trusted information sources, a priority population for COVID-19 vaccination, and potentially subjected to mandates, we investigated HCP perspectives on mandates.

Methods: A national online survey was administered to HCPs (October 2020–March 2021), including vaccine mandates questions concerning patients (measles) and HCPs (influenza). We qualitatively investigated HCP mandate perspectives through: (1) 34 interviews with HCPs, HCP professional society representatives, and health authorities; (2) a focus group discussion (FGD) with complementary medicine (CM) and biomedical physicians, and Swiss Federal Vaccination Commission members.

Results: 1933 participants (496 physicians, 226 pharmacists, 607 nurses, 604 midwives) responded to the survey. Quantitative results show all professional groups preferred shared parent–HCP measles vaccine decisions (65%, 54%, 50%, 48%, respectively; p for trend < 0.001). Midwives (87%) and nurses (70%) preferred individual influenza vaccination decisions for HCPs, while physicians (49%) and pharmacists (44%) preferred shared employee–employer decisions (p for trend < 0.001). Physicians (p < .001) and pharmacists (p < .01) with CM training favored individual influenza vaccination decisions. Qualitative results show general HCP opposition to vaccine mandates, mainly because participants argued how other approaches, such as HCP training and better information, could encourage uptake. Arguments against COVID-19 mandates included insufficiently documented long-term safety/efficacy data. From participants' perspectives, mandated vaccination should be used as a last resort. Some participants expressed fear that with mandates, notably for influenza and COVID-19, some HCPs might leave their jobs. HCPs were unsure what vaccine mandates would concretely look like in practice, particularly regarding sanctions for non-compliance and enforcement.

Conclusion: In Switzerland, HCPs generally were opposed to vaccination mandates. Clarity and guidance are needed from health authorities to better inform discussions around vaccine mandates.

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1. Introduction

There currently are no mandatory vaccines in Switzerland. In contrast, seasonal influenza vaccine has been mandatory for healthcare professionals (HCPs) in many countries for many years [1,2]. Switzerland's neighboring countries have also implemented mandatory vaccination policies in recent years (Italy in 2017, France in 2018, Germany in 2020 [3–5]). With these historical antecedents and current pressing questions about vaccine mandates for HCPs in the context of the COVID-19 pandemic [6,7], it is important to evaluate HCPs' perspectives about mandatory vaccinations in Switzerland. With the Swiss Epidemics Act, which went into effect in 2016, Swiss policy stipulates how mandatory vaccination is only possible for certain groups in particular situations. Since the law has never been applied in full force prior to the COVID-19 pandemic, this study addresses important open questions at the intersections of policy, public health, and clinical practice regarding the acceptance of vaccine mandates among HCPs in Switzerland.

Vaccine mandates have previously been effective for increasing vaccination rates [8,9,10], and certain professional societies have endorsed mandates in Europe, the US, Canada, and elsewhere [11,12]. That said, mandates have the potential to make people angry [7], stoke vaccine hesitancy and anti-government/anti-science sentiment [13,14,15] and increase polarization in vaccination discourse [16]. As such, experts on vaccination policy recommend approaching mandates with care. This involves public health authorities and policy makers being cognizant of and sensitive to issues related to the immediate expected goals of vaccine mandates, biomedical ethics, public trust in authorities, science, and medicine, and equitable access to healthcare systems [13,17–19].

Attwell and Navin [20] detail a conceptual framework which is a useful backdrop against which we will articulate our empirical findings. The framework includes various components: (1) *scope* (i.e. which vaccines are mandatory); (2) *sanctions/severity* (i.e. consequences for non-adherence and stringency of consequences); (3) *selectivity* (i.e. how to enforce/exempt people from mandates). Combined, these components speak to the *salience* of vaccine mandate policy, which refers to the fundamental question driving vaccine mandate policy: do they actually get people to vaccinate? There is substantial heterogeneity between different professionals' views on mandatory vaccination policy [21]. HCP support for vaccine mandates varies by profession and by vaccine [22,23]. Those working with patients at high risk of influenza-related complications report higher support for mandates [24]. Yet there is concern about stigmatization among HCPs regarding mandatory mask wearing because of non-compliance with influenza vaccination, which has been particularly documented among nurses [21]. Previous research has documented how mandatory vaccination and vaccination policy play influential roles in determining HCP and public vaccination attitudes and decision-making, since such policies reveal how vaccination programs have been designed at a health system level [23,25].

It is essential to understand HCPs' views on mandatory vaccination because HCPs are one of the most important influences for parents in their vaccination decision-making process [26–28] and since HCPs play key roles to “improve the public trust [in] scientific and epidemiological evidence” [29]. Researchers have also recognized the roles of autonomy [30], voices of patients, [24,31,32], and evidence-based, open communication between HCPs and patients as they likely build a foundation of trust around vaccine recommendations [24].

The aim of this study was to investigate HCPs' perspectives on vaccination mandates in Switzerland, both quantitatively and

qualitatively. In light of the COVID-19 pandemic's potential to influence people's access to and perceptions about other vaccines, it is relevant to study HCPs' views of MMR vaccination, HCP influenza vaccination, and COVID-19 vaccination [33]. In the interest of keeping the online survey as short as possible, the quantitative objectives were to analyze the attitudes of HCP groups with the most involvement with vaccination counseling and administration (physicians, pharmacists, nurses, midwives) in relation to mandates for the two vaccines which spark the most debate in Switzerland (MMR and influenza). During preparation of the survey (August–September 2020), we decided not to include hypothetical questions about potential COVID-19 vaccine mandates. The first COVID-19 vaccine was approved for human use in December 2020 in Switzerland, and vaccine roll-out among HCPs began in February 2021. The qualitative objectives were to gain insight from HCPs' perspectives to better understand their views about Swiss vaccination policy.

2. Methods

We employed a mixed-methods convergent design [34], meaning quantitative and qualitative data on similar topics were simultaneously collected. The quantitative data resulted from a survey of physicians, pharmacists, nurses, and midwives. The qualitative data resulted from semi-structured qualitative interviews with HCPs who had responded to the online survey and indicated their willingness to participate in a subsequent qualitative interview. Qualitative interviews were also conducted with professional stakeholders, infectious disease specialists, representatives of physician, midwife and nursing professional societies, and public health authorities. Further qualitative data were obtained during a focus group discussion involving complementary medicine (CM)-oriented and biomedically-oriented physicians, and members of the Swiss Federal Vaccination Commission (FVC).

2.1. Survey

The data come from a larger survey with four HCP groups in Switzerland who are involved in vaccination counselling and/or administration: (1) physicians, (2) pharmacists, (3) nurses, and (4) midwives. The survey was administered online between October 2020 and March 2021, included approximately 35 questions and was designed as a needs assessment survey to gauge HCPs' needs around vaccination knowledge and communication. Data were collected on HCPs' gender, age, canton (i.e. state) of work, field of work, year they passed federal exams to become licensed to work as a HCP, and additional accreditation or training in any discipline of complementary medicine.

We invited HCPs to participate in the study via e-mail lists of major professional societies in Switzerland, including the three key pediatric and internal medicine societies (Kinderärzte Schweiz, Swiss Society of Pediatrics [pédiatrie suisse] and Swiss Society of General Internal Medicine [Schweizerische Gesellschaft für Allgemeine Innere Medizin, SGAIM]), the Swiss Pharmacists Association [pharmaSuisse], the Swiss Association of Nurses and the Swiss Association of Midwives. Each professional society shared the survey with all members similarly by using the same procedure, which involved sending survey invitations via e-mail to members twice (a first invitation followed by a second invitation a month later).

In total, an estimated 44,290 potential participants were invited to participate in the online survey. The survey was developed in English and the definitive version translated and made available to HCPs in Switzerland in 3 national languages (German, French,

and Italian) and English. Bilingual study team members verified translations and piloted in all languages with 18 participants to clarify question wording and to check for inconsistencies.

We developed the survey questions *de novo* during discussions among the multidisciplinary research team working on vaccine hesitancy [35]. We then condensed the survey, with the goal of making it concise and appropriate for the different health professions included in the sample. We piloted the survey in collaboration with leading professionals from each HCP professional group to address inconsistencies, unnecessary jargon, potential misunderstandings, and redundancies. Qualtrics software (Qualtrics XM, Provo, Utah, US) was used as the online survey platform.

Two questions were included that collect data on HCP perspectives on vaccine mandates. The first question (“Do you think that the decision for children getting vaccinated against mumps, measles, and rubella (MMR) should be: (1) an individual choice, (2) a shared decision between parents and doctors, (3) mandatory?”) was designed to capture HCPs’ views on mandatory childhood MMR vaccination. The second question (“The annual decision concerning the vaccine against the flu for healthcare professionals should be: (1) an individual decision, (2) a shared decision between employees and employers, (3) made mandatory by the State or the employer”) was designed to capture HCPs’ views on their own influenza vaccination decisions as HCPs. Respondents were allowed to choose the option “do not wish to respond” for all survey items.

2.2. Statistical analyses of survey results

To test the relationship between four categorical variables, we conducted a loglinear analysis, a hierarchical method in which the initial model contains all main effects (the separate influence of each variable) and interactions (the influence of the combination of variables). Starting with the highest-order interaction, terms are removed to test if their removal significantly affects the fit of the model. If it does, then this term is retained and all lower-order effects are ignored [36].

We examined the relationship between the following variables:

- Belonging to a specific professional group (physicians, nurses, pharmacists, midwives)
- Having obtained additional training in complementary medicine (CM)
- Age of the HCP (as a proxy for years of experience)
- Opinions about vaccine mandates: (1) opinions about childhood vaccination mandates, particularly MMR vaccine; (2) opinions concerning mandates for HCP annual influenza vaccination.

In case of significant interactions, we broke down the effect and conducted separate chi-square tests. Since our outcome variable of interest was vaccine mandate opinions, we report only on the relevant associations. Data were tabulated and analyzed using IBM SPSS for Mac statistical package version 27.

2.3. Semi-structured qualitative interviews with HCPs and professional stakeholders and focus group discussion with HCPs

Semi-structured qualitative interviews were conducted with HCPs, HCP professional society representatives, and health authorities from September 2020 to March 2021. Upon completion of the quantitative survey, participants had the option of indicating interest in participating in a qualitative interview. From this group, we selected participants based on the criteria of gender, residence in German or French geographic areas of Switzerland and professional group, to generate as balanced a distribution of interview partners as possible. The HCPs were then contacted by e-mail in

order to share a study consent form and arrange interviews that were conducted mostly by Zoom, occasionally by phone or on-site.

We aimed to better understand these diverse stakeholders’ perspectives on mandatory vaccinations and vaccination policy. An interview guide was piloted and revisited iteratively for clarity. Qualitative interviews were audio-recorded and transcribed verbatim. Interviews allowed us to gather information about these professionals’ backgrounds (e.g. physician, pharmacist, nurse, midwife) and training (e.g. year and country of graduation, additional training in CM, additional qualifications in respective professional field), perspectives on vaccination and current vaccination coverage in Switzerland, views on vaccine mandates for the public at large, and views on vaccine mandates for healthcare professionals, particularly for vaccination against hepatitis B, influenza, and to protect against COVID-19. All HCPs had the opportunity to request our interview guide questions in advance.

To complement the interviews, a multi-professional focus group discussion (FGD) was conducted with biomedical and CM physicians, as well as Swiss Federal Vaccination Commission (FVC) experts. The FGD was part of a series of FGDs on different topics regarding vaccine hesitancy in a larger Swiss National Research Program (NRP 74) [35] and took place on 24 November 2020, shortly before the first COVID-19 vaccines were licensed and vaccination campaigns started. The FGD took place after participants attended two lectures on vaccine safety research and methods to increase vaccination rates, which served as stimulus material. The FGD specifically concerned vaccine mandates including potential COVID-19 vaccine mandates and was conducted by PET, AB and LST, and data analyzed by AB and LST. Analysis of the qualitative interviews and observations were guided by the Framework Method [37] and thematic analysis [38] with support of MAXQDA software.

Qualitative interview data were analyzed by LGD (N = 9), AL (N = 11), and MJD (N = 14). For qualitative data analysis, all interviews were analyzed and sorted using the following themes: COVID-19 vaccination and potential mandates for HCPs; population level vaccination rates in general; vaccine hesitancy; childhood vaccination rates and mandates; personal attitude toward Swiss vaccination recommendations; roles of employer and of government regarding HCP vaccination; vaccine mandates in general; influenza vaccine mandates for HCPs; vaccine hesitancy among HCPs; Swiss legal context (Epidemics Act); and recommendations for the future. We focused primarily on which statements occurred repeatedly and on the differences and similarities between the various professional groups.

2.4. Ethical considerations

The local ethics committee (Ethikkommission Nordwest- und Zentralschweiz; project-ID 2017-00725, approved on 14.08.2020) approved the conduct of the study. Informed consent was given by online survey participants by commencing the anonymous survey, and obtained from all qualitative interview participants after the nature and possible consequences of the study had been fully explained. Pseudonyms are used for participants throughout. Direct quotes were translated from the original language of utterance (German or French) into English.

3. Results

3.1. Quantitative results

In total, 1933 participants completed the online survey (496 physicians, 226 pharmacists, 607 nurses, 604 midwives). 233 (12.1%), 478 (24.7%), 505 (26.1%), 534 (27.6%), 183 (9.5%) of partic-

ipants were ≤ 30 , 31–40, 41–50, 51–60, and > 60 years old, respectively. The median year for HCPs' graduation was 2001. 80.1% responded in German, 16.2% responded in French, 2.6% responded in Italian, and 1.1% responded in English. Considering the overall number of professional society members from each group, the overall response rate was approximately 4.4% (1933 respondents among 44,290 society members) and approximately 496/ \approx 9390 (5.3%) among physicians, 226/ \approx 6700 (3.4%) pharmacists, 607/ \approx 25000 (2.4%) nurses, and 604/ \approx 3200 (19%) for midwives.

3.1.1. Associations and interaction effects

The loglinear analysis produced a final model that retained five partial associations. This indicated that the highest-order interaction (Profession \times CM training \times Age \times Opinions on MMR mandates) was not significant ($p = .06$). There were significant interactions between: "Profession \times CM training", "Profession \times Age", "CM training \times Age", "Profession \times Opinion" and "Age \times Opinion". This suggests that the opinions on childhood MMR vaccination mandates are significantly associated with profession and with age. Therefore, since the variable of interest was vaccine mandate opinions, we used the chi-square test for the significant partial association of "Profession \times Opinion" and "Age \times Opinion", and we did not consider the other partial associations that did not include the vaccine mandate opinions variable.

3.1.2. Quantitative findings: HCP opinions on MMR vaccine mandates

There was a significant association between profession and opinion about vaccination regarding childhood MMR vaccination (Table 1). 65%, 54%, 50%, and 48% of physicians, pharmacists, nurses, and midwives preferred shared decision making, respectively, while 29%, 38%, 33% and 7% preferred a mandate. In contrast, 45% of midwives stated that childhood MMR vaccination should be up to individuals but only 6%, 8%, and 16% of physicians, pharmacists, and nurses (Table 1).

There was a significant association between HCP age and opinion about childhood MMR vaccination, with shared decision-making being preferred by 46%, 49%, 54%, 58%, and 64% in the age groups ≤ 30 , 31–40, 41–50, 51–60, >60 years, respectively (Table 2). Preference for mandated vaccination decreased with age. Regarding the preference of decision up to individuals, no clear association with age was apparent.

3.1.3. Quantitative findings: HCP opinions on HCP annual influenza mandates

There was a significant association between profession and opinions about HCP annual influenza vaccination (Table 3). Physicians and pharmacists displayed various opinions (48% and 45% favored shared-decision-making, respectively). In contrast, 70% of nurses and 87% of midwives favored HCP influenza vaccination being a decision up to individuals.

There was a statistically significant association regarding physicians and pharmacists, CM training, and opinions about HCP influenza vaccination (Table 4). For the nurses and midwives, there was no evidence for such an association. Physicians and pharmacists with additional CM training were more likely to state that influenza vaccination should be an individual choice, compared to those without additional CM training.

There was a significant association between HCP age and opinion about HCP influenza vaccination. Preference of leaving the decision to the individual tended to decrease with age, among physicians, nurses, and midwives. The reverse trend was apparent for pharmacists. Preference for mandatory vaccination and for a shared decision showed no clear age trends (Table 5).

3.2. Qualitative results

Overview. We conducted 34 qualitative interviews with 27 HCPs (10 physicians, 2 pharmacists, 6 midwives, 9 nurses) and 7 HCP professional society representatives/health authorities. We also conducted a FGD with CM providers ($N = 4$) and medical society representatives ($N = 1$), a biomedical general practitioner, pediatricians ($N = 2$), vaccination experts and members of the Swiss FVC ($N = 2$). The results show different HCPs views of mandates in the Swiss context, HCP views on HCP influenza vaccine mandates, HCP views on unresolved issues regarding a potential mandatory vaccination, and on potential mandates regarding COVID-19 vaccines.

3.2.1. Differences between HCP groups regarding vaccination

Potential explanations for differences between HCP groups. Participants offered several explanations for why certain groups of HCPs might be more skeptical toward mandatory vaccination than others. Many suggested that these differences are due to their different training and professional roles. Nurse 1 (female) explained that she has the impression that many physicians "are conditioned on the only voice of vaccination and no alternative" and that it "maybe also has something to do with the Hippocratic oath, to do everything possible to save lives." Nurse 2 (female) emphasized how physicians "have studied the disease." Several physicians expressed feeling that they had the function of being role models and should be advocates of vaccination; physician 1 (male) explained, "We have a bit of a duty to lead."

In contrast, Midwife 1 (female) reported how midwife approaches are "more holistic" and "based on healthy people with an intact immune system." Several nurses offered other explanations for these differences. Nurse 3 (female) explained how nurses "are closer to the patient" than doctors and therefore have a deeper insight into their individuality. Nurse 4 (male) described how doubts about vaccination might be common for nurses, because, in his view, nurses generally "are more doubtful about the effectiveness of vaccinations."

HCP vaccination to protect vulnerable patient populations.

Participants showed awareness of the issue of mandatory HCP vaccination for protection of vulnerable immunosuppressed patient populations. Nurse 3 (female) explained, "There might be a mandate for flu vaccine when someone works on the premature birth ward and they are told, 'If you want to work with these vulnerable children, you need to be vaccinated against flu.' If someone does not want the vaccine, and this is a personal decision, they will have to work on a different ward. You also have to give high priority to protect patients and people in Switzerland." When discussing unvaccinated nurses, Nurse 3 (female) explained, "They cannot be excluded from the workplace. But they would no longer be allowed to work on wards where this could be a risk to patients. There has been a supreme court judgment on measles vaccine where an unvaccinated person was not allowed to work with immunosuppressed patients. The professional had the choice of being transferred to a different ward or getting vaccinated. The duty to protect patients played an important role."

3.2.2. HCP views on vaccination mandates in Switzerland

From most interviewed HCP perspectives, mandatory vaccination would not be viable in Switzerland. Even those HCPs who are in favor of mandatory vaccination struggled to describe what it would concretely look like in practice. For example, they discussed how the Swiss political system of federalism would not permit feasible vaccine mandates, to which one FGD participant referred to as Swiss "Kantönligeist" (spirit of focusing on local cantonal/state solutions and being generally opposed to nationally harmonized approaches). Physician 2 (male) explained, "With

Table 1
HCPs' opinions about MMR vaccine mandates.

Profession	Up to individuals	Shared decision (parents and doctors)	Mandated	Chi square test of independence
Physician	27 (5.6%)	311 (64.9%)	141 (29.4%)	$\chi^2 (6) = 365.24$ $p = <0.001$
Pharmacist	17 (7.8%)	118 (54.4%)	82 (37.8%)	
Nurse	91 (16.3%)	281 (50.4%)	186 (33.3%)	
Midwife	266 (45.4%)	281 (48%)	39 (6.7%)	

Table 2
Association between HCP age and opinion about MMR vaccine mandates.

Age	Up to individuals	Shared decision (parents and doctors)	Mandated	Chi square test of independence
≤ 30	43 (20.2%)	97 (45.5%)	73 (34.3%)	$\chi^2 (8) = 31.73$ $p = <0.001$
31–40	121 (26.1%)	227 (48.9%)	116 (25%)	
41–50	99 (20.3%)	265 (54.4%)	123 (25.3%)	
51–60	112 (22.2%)	292 (57.8%)	101 (20%)	
>60	26 (15.2%)	110 (64.3%)	35 (20.5%)	

Table 3
HCP opinions about HCP influenza vaccine mandates.

Profession	Up to individuals	Shared decision (employer/state and HCP)	Mandated	Chi square test of independence
Physician	111 (23.3%)	230 (48.3%)	135 (28.4%)	$\chi^2 (6) = 547.7$ $p = <0.001$
Pharmacist	84 (38.5%)	97 (44.5%)	37 (17%)	
Nurse	386 (69.7%)	135 (24.4%)	33 (6%)	
Midwife	511 (87.4%)	70 (12%)	4 (0.7%)	

Table 4
HCP with/without additional CM training and opinions on HCP influenza vaccine mandates.

Profession	CM training	Up to individuals	Shared decision (employer/state and HCP)	Mandated	Chi square test of independence
Physician	Yes	23 (48.9%)	15 (31.9%)	9 (19.1%)	$\chi^2 (2) = 19.1$ $p = <0.001$
	No	89 (20.6%)	218 (50.3%)	126 (29.1%)	
Pharmacist	Yes	26 (57.8%)	12 (26.7%)	7 (15.6%)	$\chi^2 (2) = 8.94$ $p = .01$
	No	60 (34.5%)	85 (48.9%)	29 (16.7%)	
Nurse	Yes	64 (64.6%)	27 (27.3%)	8 (8.1%)	$\chi^2 (2) = 2.4$ $p = .30$
	No	333 (71.8%)	107 (23.1%)	24 (5.2%)	
Midwife	Yes	236 (89.4%)	26 (9.8%)	2 (0.8%)	$\chi^2 (2) = 2.2$ $p = .34$
	No	279 (85.6%)	45 (13.8%)	2 (0.6%)	
Total	Yes	349 (76.7%)	80 (17.6%)	26 (5.7%)	$\chi^2 (2) = 71.09$ $p = <0.001$
	No	761 (54.5%)	455 (32.6%)	181 (13%)	

Table 5
Associations between HCP age, professional group and opinions about HCP influenza vaccine mandates.

Age	Profession	Up to individuals	Shared decision (employer/ state and HCP)	Mandated	Chi square test of independence
≤ 30	Physician	4 (36.4%)	2 (18.2%)	5 (45.5%)	$\chi^2 (6) = 86.05$ $p = <0.001$
	Pharmacist	12 (35.3%)	16 (47.1%)	6 (17.6%)	
	Nurse	65 (77.4%)	19 (22.6%)	0	
	Midwife	78 (92.9%)	6 (7.1%)	0	
31–40	Physician	31 (27.7%)	54 (48.2%)	27 (24.1%)	$\chi^2 (6) = 137.95$ $p = <0.001$
	Pharmacist	19 (34.5%)	26 (47.3%)	10 (18.2%)	
	Nurse	89 (71.8%)	29 (23.4%)	6 (4.8%)	
	Midwife	152 (88.4%)	19 (11%)	1 (0.6%)	
41–50	Physician	41 (25%)	77 (47%)	46 (28%)	$\chi^2 (6) = 126.8$ $p = <0.001$
	Pharmacist	20 (42.6%)	17 (36.2%)	10 (21.3%)	
	Nurse	108 (73.5%)	29 (19.7%)	10 (6.8%)	
	Midwife	103 (82.4%)	20 (16%)	2 (1.6%)	
51–60	Physician	21 (18.1%)	60 (51.7%)	35 (30.2%)	$\chi^2 (6) = 167.6$ $p = <0.001$
	Pharmacist	19 (30.6%)	33 (53.2%)	10 (16.1%)	
	Nurse	104 (62.7%)	50 (30.1%)	12 (7.2%)	
	Midwife	140 (88.1%)	19 (11.9%)	0	
>60	Physician	14 (19.2%)	37 (50.7%)	22 (30.1%)	$\chi^2 (6) = 55.2$ $p = <0.001$
	Pharmacist	14 (70%)	5 (25%)	1 (5%)	
	Nurse	20 (60.6%)	8 (24.2%)	5 (15.2%)	
	Midwife	38 (84.4%)	6 (13.3%)	1 (2.2%)	

direct democracy, it is impossible to pass [a vaccine mandate law] in Switzerland [because] it's a liberal country." Some participants described mandatory vaccination as an extreme intrusion on personal rights and autonomy.

Demand for self-determination. Nurse 4 (male) stated, "It's my health, it's my body. This is a massive invasion of my personal rights." Similarly, Physician 3 (female) explained, "It seems that free will is what we've been taught all along, that our bodies

belong to us, and that when vaccination is imposed, it doesn't make a lot of sense." One of the vaccination experts in the FGD made it clear why he did not expect vaccination mandates in Switzerland, "We are in a democracy that functions very well, where discussion actually takes place and mutual respect is present. Because of that, the population's participation in political issues is much greater compared to other countries where polarization is much stronger."

Potential negative consequences. HCPs and stakeholders agreed that mandates could lead to population resistance and even bring willingness to vaccinate to decrease. Midwife 1 (female) explained, "I have the impression that, perhaps as a reaction, vaccine mandates would do more damage to vaccination rates than they would actually solve problems." Nurse 2 (female) explained, "When you commit people to something through obligation, they often do the opposite."

3.2.3. HCP views on HCP influenza vaccine mandates

Many HCPs reported negative personal experiences with the influenza vaccine. For example, several described how they got sick after getting the influenza vaccination, which contrasted to years when they had not gotten the vaccine. For example, Midwife 3 (female) explained, "I personally got [the influenza vaccine] once and got so ill that I was really out for a fortnight." Nurse 5 (female) described a similar experience, "I'd rather have the flu again than go through that again. It was really horrible." Many HCPs expressed doubts about the efficacy of the influenza vaccine. Midwife 4 (female) explained for example that "the main problem is the non-effectiveness. For example, the wrong virus strains are covered in the vaccine's protection." Physician 4 (male) described his reticence similarly, "It's kind of the low efficacy that's holding me back."

Lack of appreciation. Many HCPs, particularly nurses and midwives, reported feeling a lack of appreciation and insufficient payment for their work. Nurse 6 (female) explained, "That has already led to a lot of discontent. (...) The appreciation of what we already accomplish is lacking." Nurse 4 (male) added that many nurses have a "feeling that their work is not valued enough." Participants discussed how this devaluation of their work also impacts vaccination attitudes. Physician 5 (female) explained, "You really shouldn't be surprised if people don't get vaccinated out of protest, whether it's the flu vaccine or some other vaccine".

Consequences of the lack of appreciation. Participants expressed a concern that some HCPs, particularly nurses, would change professions if vaccines became mandatory. Nurse 7 (female) said, "You have to be careful with the nursing staff. You won't find a replacement for qualified staff." Physician 3 (female) added, "So it's really a profession that takes risks. Nurses are already poorly paid. Perhaps we shouldn't add another layer." Others argued how imposing influenza mandates upon HCPs would be asking HCPs to add to the work that they already do with their bodies. Midwife 1 (female) said, "Once again, it is our bodies that are put to work for others."

3.2.4. HCPs views on unresolved issues regarding potential mandatory vaccination

In line with Attwell and Navin's multicomponent framework [20], we asked participants about open issues concerning vaccine mandates in the Swiss context. We asked the following questions to gauge HCP and professional stakeholders' knowledge and understanding of Swiss vaccination policy: (1) who are the policymakers (e.g. the State or the employer)?; (2) how would HCPs react to potential mandates?; and (3) what are the consequences for non-compliance?

Who are the policy makers? For this question, the opinions of HCPs who work in private medical practices and those who work in

a hospital diverged. As the relationship between employer and employee is closer in a medical practice, it may be easier to reach consensus without obligation, which is more difficult in the hospital. Physician 6 (male) explained, "We're really convinced [of the vaccine's usefulness], and we're close to our staff. That's why we don't need a mandate. But, in a hospital setting, it's much more complicated."

How would HCPs react to potential mandates? Regarding potential HCP reactions to mandates, participants consistently hypothesized that they would be met with resistance. Some professionals mentioned the possibility of HCPs abandoning their professions because of vaccine mandates. Nurse 2 (female) explained her fears, "This would cause an immense number of health care workers to leave their jobs." Nurse 8 (male), explained, "I don't know if I'd still want to work in this system."

What are the consequences for non-compliance? This question proved difficult for participants to answer. Physicians in charge of their own private practices reported being content with not being in the position to mandate vaccinations for their employees and that they would not know how to address issues of vaccine refusals. Others discussed alternatives to mandates in clinical settings, such as the idea that HCPs who refuse to get vaccinated should not be allowed to work with high-risk patients, such as newborns, or mandatory mask wearing for HCPs who refuse vaccination. A health authority participant explained, "If someone doesn't want to get vaccinated, which is a personal decision, then they are simply assigned to another place of work. The protection of patients or the people in Switzerland must be weighted heavily."

3.2.5. HCP views on potential COVID-19 vaccine mandates

COVID-19 vaccination dilemmas. Many HCPs described the dilemmas in which they found themselves *vis-à-vis* COVID-19 vaccination. Many discussed the novelty of COVID-19 vaccination and how the lack of long-term safety and efficacy data was problematic. Some described how they were skeptical about this new vaccination and questioned long-term safety issues. Physician 1 (male), interviewed in November 2020, explained how potential COVID-19 vaccine mandates would "be imposing a vaccination that is controversial and could be dangerous for people." Physician 7 (female) also expressed her doubts, "I have the impression that we are playing trial and error, that in phase three of the trial the vaccine is tested directly on the population." Healthcare authority 1 (male) said, "I think that's dangerous, because I think when we talk about a mandatory vaccination, we're talking about 8 million people. We must be extremely sure that we are giving them a safe vaccine. It doesn't even have to be effective. It just has to be safe."

When asked about potential COVID-19 vaccine mandates, HCPs described how they would be divisive for society. CM physicians in the FGD expressed patients' worries regarding COVID-19 vaccine mandates were being politicized as a fear-mongering tactic with a hidden political agenda. Some participants discussed the long-lasting negative consequences of the pandemic and how COVID-19 vaccination could be a tool to allow for a return to normality. Pharmacist 2 (female) pointed out "the pressure of suffering and wanting to get back to normality." Physician 4 (male) said, "For me, the benefit-risk balance is still largely on the side of the benefits."

Other possible ways forward. Many participants explained how vaccination would not be the only solution to ending the COVID-19 pandemic. Some mentioned the difference between vaccines and other preventive medicine methods. Midwife 5 (female) for example mentioned natural immunity as a component of health promotion, "The more you strengthen your immune defenses, the more real protection we can develop." Midwife 6 (female) described, "[Vaccination is] a great tool, but it shouldn't be the only one. It's absolutely not necessary to push here." Nurse

4 (male) said “I think that in the context of COVID-19, there are basic preventive measures, for which we should be more active, before mandating vaccination.” As an alternative to mandated vaccination, some participants mentioned to put focus primarily on communication and training of the population. They argued how “lay people” should receive all necessary information and thus be able to decide based on this knowledge. Physician 6 (male) said, “You have to emphasize communication. You need to engage with the people, so they can make a decision. Don’t just say, ‘The vaccine is mandatory.’”

Fear of indirect coercion. Some HCPs expressed a fear that COVID-19 vaccination would indirectly be made mandatory. They discussed how vaccination could become a pre-requisite to engage in certain activities. Physician 8 (female) argued “but it’s going to be complicated to make it mandatory. I think it will be the opposite. People will get vaccinated because otherwise they can’t travel anymore.” A health authority explained potential mandatory measures for those in contact with elderly populations, “If I now say that I want to protect older people [via vaccination requirements], everyone has contact with older people. This becomes a potential backdoor for a comprehensive mandate.”

Discussions demonstrated how the principles of freedom of choice and self-determination explicitly and implicitly undergird legal, social, and health considerations in the Swiss health system. From participants’ views, such principles do not align with the perception of interference by the state in preventive health care. Physician 8 (female) astutely summarized this idea, “The state has lived up to its responsibility to buy the vaccine, to have a program. But there is also the self-responsibility of the human being. The State cannot do everything. We are a democratic country. We respect human beings” (Physician 8, female).

Summary. Overall, participants expressed concern about long-term consequences of COVID-19 vaccination mandates for the future, which would have implications also for other vaccines. For example, a professional society representative explained, “If you do something wrong with this recommendation, then people will not only avoid vaccinating against COVID-19, but they will also avoid getting vaccinated for other things.” Swiss Federal Vaccination Commission (FVC) members involved in the FGD clarified that mandatory vaccination was not being considered by the federal authorities and the main goal of the authorities should be providing adequate information to avoid uncertainty among the population. One explained, “In the media, things are written by people who don’t know what they’re writing and read by people who don’t know what they’re reading. I think that’s where we need to put our energy: into communicating what we know, communicating what we don’t know, and being transparent about it.”

4. Discussion

As highly trusted sources of vaccination information, HCPs play an important role in influencing vaccination attitudes in consultations and in public discourse. Our findings show that although there are differences between the HCP groups on how to address vaccination policy (individual vs. shared decision-making vs. mandatory vaccination), HCP participants were generally opposed to vaccine mandates. Most HCPs in all professional groups favored shared decision making between parents and HCPs for childhood MMR vaccination. Regarding HCP influenza vaccination, the quantitative data show that physicians and pharmacists tended to prefer shared employee-employer decision-making, while midwives and nurses tended to prefer individual decisions. This underlines what Gualano et al. [21] discussed about heterogeneity between different professional groups. We found increasing age and CM training to be associated with a preference for individual or shared vaccination decision-making. This may point to how, with increas-

ing, diverse professional experience, HCPs may become more critical of vaccine mandates.

Although Hollemeyer et al. [23] reported that mandatory vaccination policy for HCPs may be an effective intervention in terms of vaccination uptake, our study’s qualitative results provide insights into how vaccine mandates would likely be met with HCP opposition in Switzerland. Furthermore, study participants expressed a fear that mandatory vaccination for HCPs might bring professionals, particularly nurses, to leave the profession. Such findings echo other studies which have shown how mandates have the potential to make people angry [7] and increase both vaccine hesitancy [13,14,15] and polarization in vaccination discourse [16]. These results are even more striking since data were collected with HCPs who bear much responsibility for communicating about vaccination in a professional capacity.

Qualitative results about HCP views on potential COVID-19 vaccine mandates similarly show general HCP opposition, in the setting of insufficiently documented safety, efficacy, and long-term protection evidence at the time of data collection. During the FGD from November 2020, opposition to COVID-19 mandates was unanimous among Federal Vaccination Commission members, CM society representatives, and physicians.

With support of the conceptual framework developed by Attwell and Navin [39], our qualitative evidence on vaccine mandates points to unresolved issues in Switzerland regarding *scope* (i.e. which vaccines would be mandatory), *sanctions and their severity* (i.e. consequences for non-adherence and stringency of consequences), and *selectivity* (i.e. how to enforce/exempt people from mandates). It is important to note, however, that although the Swiss Epidemics Act provides the legal framework for the potential introduction of mandatory vaccination [40], Swiss federal authorities have consistently and repeatedly pointed out that all HCP vaccination is voluntary, and that all COVID-19 vaccination in Switzerland (for HCP and the general population) is voluntary [40].

This study has several strengths. It provides perspectives on mandatory vaccination from a diverse array of the principal vaccination counselors in Switzerland (physicians, pharmacists, nurses, and midwives). Data collection was also done at a key time during the COVID-19 pandemic, when interest in the topic was high and HCPs were in the spotlight about these issues. Furthermore, the mixed-methods approach offers rich insight into HCP views by establishing a large, heterogenous sample using quantitative data collection methods and documents participants’ views on vaccine mandates in their own words.

A limitation of this work is that the survey was administered during a time when there were rapid shifts in approaches to pandemic management and many uncertainties about COVID-19-related health policy in Switzerland, including vaccination. These aspects are important to note when considering our results. As Deml et al. [41] have shown, HCPs views about vaccination and their patients’ vaccination status have implications for their professional reputations. Therefore, it is fair to assume that there is social desirability bias present in the way that HCPs responded to both the quantitative survey and during qualitative data collection. Finally, our survey was not representative of all HCPs from these professional groups in Switzerland. However, we believe that our survey and qualitative results broadly reflect the perspectives of Swiss HCPs based on our sampling strategy for qualitative interviews, our personal discussions with HCPs and based on the current discourse on vaccine mandates at professional meetings and in the media.

5. Conclusions

Because the federal authorities have clearly stated that all vaccination including COVID-19 vaccination remains voluntary in Switzerland and because the Swiss Epidemic Act, which took effect

in 2016, does not include language on any sanctions for non-adherence to possible mandates, it is not surprising that HCP participants were unclear on potential consequences for non-adherence to vaccination mandates and the stringency of consequences. An interesting aspect of current public and expert debate on vaccine mandates in Switzerland is the notable discrepancy between the statements on voluntary vaccination from Swiss Federal authorities [40] and the fears about mandates expressed by HCP study participants. Since the healthcare system in Switzerland is multifaceted and pluralistic, with divergences between different professional groups and between private practice and hospital practice, further clarity and guidance is needed from health authorities and governing structures in a way that these current vaccination policy and health authority positions are more uniformly understood and supported among HCPs and the public.

CRediT authorship contribution statement

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Declaration of Competing Interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.vaccine.2021.12.071>.

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